Letters to the Editor

Comments on Workshop Report on the Economic and Environmental Impacts of Biobased Production

by Amy E. Landis and Thomas L. Theis

[Int J LCA 10 (3) 226–227 (2005) (DOI: http://dx.doi.org/10.1065/lca2005.04.202)]

Alvin L. Young

Visiting Professor, Institute for Science and Public Policy, Sarkeys Energy Center, University of Oklahoma, Norman, Oklahoma, USA (youngrisk@aol.com)

DOI: http://dx.doi.org/10.1065/lca2005.04.203

In the last issue of the Int J LCA 10 (3) 226–227 (2005), there is a conference report by Landis and Theis on: 'Workshop on the Economic and Environmental Impacts of Biobased Production' [1]. I did not attend the workshop, but I am very familiar with the subject matter. From their report, it was clear that the workshop emphasized the importance of life cycle assessment, but a real example of how biobased materials compare to petroleum-based materials was not given. For example, a comparison on the production of polyurethane from soybean polyols versus polyurethane from petroleum-based polyols would have given a real view of the competitiveness, environmental impact, and energy requirements between the two sources [2]. The results would have shown that soy polyols show one one-quarter the level of total environmental impact that petroleum-based ingredients have on the environment. Moreover, no mention was made in the workshop report of the life cycle model developed by the National Institute of Standards and Technology (NIST) called BEES (Building for Environmental and Economic Sustainability) [2]. With the use of BEES, the entire life cycle, from growing the soybeans to using them in plastics or other products has been examined and documented, and these new products are successes [3,4]. Unfortunately, the authors of the conference report focused on the mundane issues of sessions, importance of authors, presentation titles, and breakout techniques, rather than the critical issues associated with biobased production. The section of the report on 'Analysis of Workshop Outcomes' left me wanting to know more about the outcomes rather than questions asked with no answers.

There are extraordinary things happening in biobased research and production. For example, in the United States the implementation of the 2002 Farm Bill Energy Title called for all US government agencies to use biobased products. In July of 2004, the Department of Energy (DOE) implemented and was promoting its 'Buy Bio Initiative' which required DOE to use soy-based cleaners, biodiesel, and other biobased products [5]. In Europe, the European Eco-Label Scheme has been implemented. The scheme enables European consumers, including public and private purchasers, to easily identify officially approved green products across the European Union, Norway, Liechtenstein, and Iceland [6]. To date, the European Commission (EC) on Environment has awarded more than 300 products the European eco-label. Criteria are available for different product groups such as textiles, paints, detergents, and soil improvers [6].

Within the research arena, perhaps the most significant activity has been a new 'Strategy Paper' developed by the US-EC Task Force on Biotechnology Research. The new Strategy Paper was titled ***Plant-Based BioProducts: Creating Value from Renewable Biological Resources*** [7]. The Strategy Paper "presents a vision for creating a new knowledge-based bioeconomy in which industry uses renewable raw materials for the sustainable manufacture of energy and other non-food, non-feed products needed by society." The US-EC Task Force examined opportunities for developing research and technologies to underpin these plant-based bioproducts [7]. The Task Force has established a Steering Committee for facilitating and coordinating (EU-US) research in molecular biology to create or improve biobased products and biofuels. The goals of the Committee are to:

1. Identify research needs and select priority research areas and flagship projects of common interest and benefit.
2. Identify and promote interdisciplinary, multinational teams to conduct research, and transfer technologies.
3. Facilitate the identification and development of flagship projects and other joint activities of common interest, which may include scientific exchanges, training, and other opportunities for students, postdoctorals, and early career scientists.
4. Organize and/or sponsor symposia, position papers, information delivery targeting scientific communities, stakeholders, and the public [7].

Industry is also stepping up to the challenges and opportunities to link biotechnology, chemistry, and agriculture to create new value chains. The First 'World Congress on Industrial Biotechnology and Bioprocessing' was held in April 2004 in Orlando, Florida. The Second Congress is now schedule for April 2005 in Orlando [8]. Industrial biotech-

nology has been described as the 'third wave' in biotechnology, and with advances in this field accelerating, the conferences are intended to stimulate dialogue, collaboration, and fostering the diffusion of industrial biotechnology throughout the manufacturing sector on the international scale [9]. In opening remarks at the First World Congress, the President of the Biotechnology Industry Organization concluded: "*With industrial output in populous nations, such as China and India, growing rapidly, new technologies are desperately needed to enable sustainable growth. At this stage, biotechnology's greatest uses are in medicine and agriculture, but its greatest long-term impact may well be industrial.*"

If we are to obtain the economic and environmental benefits that are in biobased materials and production, we must promote the advantages of doing life cycle analysis in all its aspects. And to that end, the Conference Report is a contribution.

References

[1] Landis AE, Theis TL (2005): Conference Report: Workshop on the Economic and Environmental Impacts of Biobased Production. Int J LCA 10 (3) 226–227

[2] Pollack JW (2004): Soy vs. Petro Polyols: A Life-Cycle Comparison. A Project Sponsored by USDA and Omni Tech International Ltd. Available at web site <http://www.unitedsoybean.org/lib_bbs.htm>

[3] United Soybean Board (2004): Soy-based Insulation Name 'Outstanding Green Product of the Year'. Biobased Solutions Newsletter 5 (3) May <http://www.unitedsoybean.org/lib_bbs.htm>

[4] United Soybean Board (2004): Bio-Food-Grade Greases Gear Up to Replace Traditional Petroleum-Based Synthetics. Biobased Solutions Newsletter 5 (3) May <http://www.unitedsoybean.org/lib_bbs.htm>

[5] United Soybean Board (2004): Government Procurement of Biobased Products Gains Momentum. Biobased Solutions Newsletter 5 (4) July <http://www.unitedsoybean.org/lib_bbs.htm>

[6] European Commission (2004): European Union Eco-Label Homepage web site <http://europa.eu.int/comm/environment/ecolabel/index_en.htm>

[7] US-EC Task Force on Biotechnology Research (2005): Strategy Paper – Plant-Based Bioproducts: Creating Value From Renewable Biological Resources. The Task Force exists as a subgroup of a government-to-government commission between the European Union and the United States. Within the US government it is based within the Office of Science and Technology Policy, Executive Office of the President, Washington DC. The Steering Committed Report is available through a USDA web site <http://www.pw.usda.gov/wrrcpagedoc/euus/index.htm>

[8] The World Congress on Industrial Biotechnology and Bioprocessing. April 20–22, 2005, Orlando, FL <http://www.bio.org/worldcongress>

[9] BIO (2004): Summary Proceedings of the First World Congress on Industrial Biotechnology and Bioprocessing. Available from: Biotechnology Industry Organization, 1215 Eye Street, NW, Suite 400, Washington DC 20005-5958, USA, or at web site <http://www.bio.org>

Book Reviews

L'Analyse du Cycle de Vie d'un produit ou d'un service. Applications et mise en pratique

Authors: Laurent Grisel and Philippe Osset
Publisher: AFNOR, Paris 2004; ISBN 2-12-475091-7
Reviewer: Jean-Francois Le Téno

DOI: http://dx.doi.org/10.1065/lca2005.04.003

That this book contains a very short description of standardised LCA steps in Annex B only, and that Annex C is about how NOT to do an LCA say it all.

Reputed experts and practitioners of LCA Laurent Grisel and Philippe Osset offer readers of 'L'Analyse du Cycle de Vie d'un produit ou d'un Service – Applications et mise en pratique' (Life Cycle Analysis of a product or a service – Applications and practice) a very clear and pedagogical book that guides them – with numerous references to real cases, from applications of LCA to single products to their contributions to the definition of sustainable development policies.

This book is therefore not about theory, it is about practice of a methodology (LCA) and a conceptual model (the so-called 'life-cycle approach') that has come of age thanks to intensive and sometimes very harsh field tests performed by industries on a whole or governments trying to define and substantiate improved environmental products and policies.

That LCA is now a reputable and recommended methodology is demonstrated in Part I of the book, thus allowing the authors to move to presenting and discussing products environmental evaluation, improvement and innovation applications in Part II and to discuss products environmental information communication, sharing and enrichment between stakeholders in Part III.

The demonstration is striking that thinking in terms of life cycle is necessarily leading to thinking out of the box in technical but also human, commercial and economical terms. A very interesting aspect of LCA pointed out by MM Grisel & Osset is that collaboration between stakeholders is a clear key to mutual environmental (and economical) benefits.

Part IV follows a similar line of reasoning, but starts from single production plants evaluation to move on to quality – health – environment integrated management systems and industrial ecology. Finally, Part V present the strong links and inputs of LCA to sustainable development.

The practice of LCAs is presented and discussed at length in Part VI, starting from a description of their 'ecosystem' – with an ever evolving and growing biotope of standards, tools and data sources in which a very varied and often conflicting 'fauna' of stakeholders interacts.

In a second section, the authors deliver precious advice on how to successfully manage LCA-based projects to the best interest of those involved and with a view to the diffusion and reuse of the knowledge produced to other users and objectives.

Overall, the book is a timely landmark on the LCA fast growing path, giving readers a wide angle picture of all concepts, fields and issues involving LCA today. Of even higher value to many readers, it offers a quintessence of years spent by both authors contributing to advances in theory while intensively practicing LCA.